

AOARD REPORT

The 1993 Institute of Electronics, Information and
Communication Engineers (IEICE) Fall Conference



Sept 5-8 1993
S. J. Yakura
AOARD

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AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

ASIAN OFFICE OF AEROSPACE RESEARCH AND DEVELOPMENT

TOKYO, JAPAN
UNIT 45002
APO AP 96337-0007
DSN: (315)229-3212
Comm: 81-3-5410-4409

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To: Dr Shiro Fujishiro
From: Dr S. Joe Yakura

Date: 14 Oct 93

Subject: Trip Report - The 1993 Institute of Electronics, Information and Communication Engineers (IEICE) Fall Conference

ABSTRACT:

The 1993 Institute of Electronics, Information and Communication Engineers (IEICE) fall conference was held 5-8 Sep 93 at Hokkaido Institute of Technology. There were 2,161 oral papers and panel discussion sessions in this domestic Japanese conference. Conforming to the usual pattern of the domestic Japanese conference, there were no poster papers.

One noticeable paper addressed in this conference was the generation of a 2.5 picosecond soliton pulse at 15 GHz by an NTT researcher. He used the monolithically integrated MQW-DFB-LD/MQW-EA modulator and the dispersion decreasing fiber to generate such a short pulse soliton. This shows a promise for the high throughput transmission test of propagating a soliton pulse over a long distance, i.e., more than 10,000 kilometers.

In general, Japanese research is moving more and more into the basic research arena. This is the case especially in the field of optical devices and communications. Many papers presented in this IEICE Fall Conference came from Japanese industrial research laboratories.

Purpose: Attend the Japanese IEICE Fall Conference

Time and Place: 5-8 Sept 93 at the Hokkaido Institute of Technology in Sapporo, Japan

Comments/Observations:

o The 93 IEICE conference lasted for four days, 5-8 Sept 93, with a total of 2,161 presentations, including 2,013 papers, 2 panel discussions, 5 invited papers, and 139 special topical symposia and 4 tutorial sessions. There was no poster paper presented in the conference. Each paper was normally given 10 minutes for presentation and 5 minutes for questions and answers. In most of the sessions I attended, the audience asked many specific technical questions to a presenter during a 5 min questions-and-answers period. I would say for those people who have not involved on a specific research topic, it would be very difficult to follow the presentation. Since each presentation lasted only for 10 minutes, the presenter did not waste any time discussing much background in his or her research work and spent most of the time discussing their specific research efforts.

o All presentations were made in lecture rooms and class rooms of the Hokkaido Institute of Technology. There were up to 31 large and small simultaneous sessions taking place, ranging from basic research to applications that dealt anything with electronics, communications and information science. In general, each session consisted of approximately 10 papers in the morning

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and the same number in the afternoon.

o One of the invited papers, as presented by former president of Hokkaido Institute of Technology and emeritus professor of the Hokkaido University Tadashi Matsumoto, discussed the future trend of the Japanese industry and educational system. He pointed out that it is fortunate for Japanese top managers to have engineering or science degrees, in contrast to the US top managers where they have marketing, and finance degrees, which are not helpful in solving technical problems. However, in the future, the Japanese managers need to think about receiving broader education in social science and humanity so that as what Prof Matsumoto calls the humanware and userware training should be included in academic training as part of engineering requirements for future engineers in the 21st Century.

He was rather critical of the current Japanese educational system. He commented that the lack of funding in science by Monbusho had deleterious effects in university research activities over a 10 year period, between 1982 and 1992, due to the zero ceiling educational budget policy. The damage was especially great at national universities. Hence, almost no basic research was carried out at many of the Japanese universities during that time. Rather, in Japan what we called the applied basic research was carried out in industrial sector by many of giant Japanese corporations for the benefit of expanding the existing market and maintaining the competitive edge over other companies in the world. Thus their research was more in the line of improving the existing product within a very specific area of technology that is of particular interest to the survival of the company. Therefore, the Japanese research always had the flavor of applied science rather than basic science.

Prof Matsumoto was very critical of the attitude by college students also. He criticized that many students enter the prestigious colleges and universities because of the future employment prospect, not of the quality of education they can receive in their fields. He stressed that students should demand quality education and at the same time colleges and universities should be responsible for providing the best possible education to their students.

To promote basic research in Japan, Prof Matsumoto felt it is time for Japan to purchase smarts from every corner of the world as what the US did shortly after World War II using the enormous capital of the country.

o One of the conference symposia that I attended was called the future development of optical network systems. There were two papers presented in this symposium: The first was by NEC Corporation's Optoelectronics Research Laboratory entitled "A Novel Optical Cross Connect System of Hitless Optical Network Reconfiguration" and the second was by NTT Transmission Systems Laboratory entitled "Transport Network Architecture Using Optical Paths".

The first paper proposed the use of a building block concept for combining an matrix-optical switching network system and a digital cross-connect system to configure an information flow network system. It basically implements the nodal technique to alter the data highway network system based on data traffic requirements. As compared to an electrical switching system, an optical system does not pose any problem in having to deal with any interference from neighboring nodes; thus, providing an easy way to inspect functionality of an individual node without ever worrying about interference from other nodes. The paper presented the results of experiments for an 8x8 matrix optical switching network system. It revealed no sign of the nodal interference, confirming the validity of the proposed idea.

The second paper compared the two optical path techniques used in routing information through the broadband-integrated service digital network (B-ISDN) system based on frequency division multiplexing (FDM) and wavelength division multiplexing (WDM). The two techniques investigated in this paper were based on end-to-end and node-to-node types. The end-to-end type used the end-to-end network information to decide the routing of information within the network as compared to the node-to-node type where the routing decision is made between two adjacent nodes. For a network system consisting of more than two nodes, the node-to-node type becomes more complex in determining the number of routing paths. However, when these two types were implemented to a system that consisted of less than 8 nodes, not much difference was observed in the number of wavelength paths that the system could handle. Hence, the basic point of this paper was to report that one can use either end-to-end or node-to-node type for a simple network system. As far as investigating a more complex system, which consists of a large number of nodes, this paper did not cover that aspects of the problem. Rather, it was left for the future investigation.

o In the area of optical communications a large number of papers were presented by NTT researchers. Other companies were KDD, NEC Corporation, Fujitsu, Hitachi, ATR, Furukawa, and Toshiba. Only a limited number of papers presented by Japanese university researchers. There were numerous papers reported in dealing with erbium doped fiber amplifiers (EDFA). Few papers by NEC Corporation reported the experimental results of transmitting the optical signals at 10 Gb/s over the distance of 1000 km at acceptable eye opening penalty levels.

One noticeable paper in this session was the generation of a 2.5 ps soliton pulse at 15 GHz by an NTT researcher. It used the monolithically integrated MQW-DFB-LD/MQW-EA modulator and the dispersion decreasing fiber to generate such a short pulse soliton. This provides the promise for testing the high throughput transmission test of propagating a soliton pulse over a long distance, i.e., more than 10000 km .

Summary:

The Japanese research is moving into more and more into basic research arena. That is the case especially in the field of optical devices and communications. Many papers presented in this IEICE Fall conference came from Japanese industrial research laboratories.